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Histories for an Uncertain Future: Environmental History and Climate Change

RUTH A. MORGAN

In the wake of a decade of crippling droughts, cyclones, floods and fires, and warnings that as a result of anthropogenic climate change such events will be more frequent and intense in the future, historical research into Australian weather and climate is growing. The focus of these studies ranges from the quotidian to the extreme and from the lay to the scientific, offering insights into the experience, measurement, interpretation and prediction of weather and climates since British colonisation. In doing so, they engage with familiar themes of Australian environmental history, such as adaptation, local knowledge, expertise, Western science, sustainability and economic development, as well as demonstrating emerging interests in anxiety, risk and resilience. Here I consider this recent historical research on Australia’s climate and its variability, as well as the implications of anthropogenic climate change for the ways in which we undertake writing history.

In 2013, two significant developments marked the seventy-fifth anniversary of Guy Stewart Callendar’s 1938 observation that humanity’s emissions of carbon dioxide into the atmosphere were warming the planet.1 In May, the National Oceanic and Atmospheric Administration in the United States reported that the concentration of carbon dioxide in the atmosphere had passed 400 parts per million (ppm).2 To put this milestone in perspective, the last time the concentration of carbon dioxide had reached such levels was during the Pliocene epoch, between 2.6 million and 5.3 million years ago. This means that the recommended threshold of 350 ppm required in order to avoid irreversible climate change has been exceeded.3 Meanwhile, an international study of peer-reviewed climate research found overwhelming consensus among scientists that humans are responsible for global warming.4 It is therefore timely for historians to consider just how we arrived at this point by examining

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humanity both as a species and as a collection of societies. Here I consider recent historical research on Australia’s climate and its variability, as well as the implications of anthropogenic climate change for the ways in which we undertake writing history. Furthermore, in light of these scientific findings, I suggest that environmental historians have an especially important and urgent role in connecting people to place, and the global to the local, in order to understand the complex roots of our climate predicament.

Thirty years after Geoffrey Blainey lamented the paucity of histories of Australian weather and climate, this area of research is growing in the wake of a decade of crippling droughts, cyclones, floods and fires, and warnings that such events will be more frequent and intense in the future. The focus of these studies ranges from the quotidian to the extreme and from the lay to the scientific, offering insights into the experience, measurement, interpretation and prediction of weather and climates since British colonisation. In doing so, they engage with familiar themes of Australian environmental history, such as adaptation, local knowledge, expertise, Western science, sustainability and economic development, as well as demonstrating emerging interests in anxiety, risk and resilience. These are narratives shared on the page as well as displayed online and through art and museum exhibitions, which help to communicate these stories beyond universities. Furthermore, they reflect an effort in the humanities to contribute to addressing and dealing with global change, particularly anthropogenic climate change. Together, these histories contribute to a broader historical understanding of how the nation has attempted to come to terms with the normal and abnormal, the natural and unnatural, in an ancient land.

The contemporary field of environmental history, reflecting its origins in the new environment movement of the 1970s in North America, has provided practitioners with a medium through which to explore the history of current environmental concerns. In Australia at least, environmental historians have also advocated issues-based approaches to their studies to provide a practical purpose for their work in order to ensure the longevity and development of their field. In this tradition, political and scientific concerns about climate variability and anthropogenic climate change both in Australia and abroad have prompted environmental historians to consider these issues more closely.

The Millennium Drought (2000–7), Al Gore’s Inconvenient Truth (2006), the 2007 report of the Intergovernmental Panel on Climate Change, and the Rudd government’s 2007 ratification of the Kyoto Protocol provided encouragement for this work. The backdrop for many of these recent studies has been Dorothea

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Mackellar’s land of ‘drought and flooding rains’, the southeast of Australia. More particularly, since Richard Grove’s innovative work on El Niño and colonial New South Wales, environmental historians have focused largely on how settler Australians have tried to understand the climates, hydrologies and ecologies of the Murray-Darling Basin, the changes wrought upon the region, and how these changes have affected and continue to affect the Basin and its people. Others have examined how Australians have historically responded to challenges of water scarcity from the Victorian Mallee to the southwest of Western Australia. Meanwhile, Libby Robin and Chris O’Brien have urged us to overcome a historical temperate bias in order to consider the wet and the dry: the booms and busts of desert and tropical climates. Together, these histories form part of a broader history of coming to grips with Australia and the environmental challenges that have shaped its settlement and development.

As anthropogenic climate change forces us all to come to terms with climatic conditions potentially quite different from those we have experienced, environmental histories of Australian climates can usefully shed light on how societies have apprehended risk and climate variability in the past. In settler Australia, as these environmental histories suggest, climate fluctuations challenged settler...
assumptions of uniformitarianism, and their social and economic toll required adaptations with experience over time. Even as anthropogenic climate change destabilises many settler understandings of their ‘new land’, uncertainty and variability are likely to remain the norm in Australia.

Although Western science, economics and engineering have long spoken for nature in Australia, the ancient land has often resisted being spoken for, demanding from its settlers the development of local understandings of the environment. Developing historical understandings of these processes highlight the fluid boundaries between the complementary fields of environmental history and histories of science and technology. Our understanding of the process of the development of settler Australian scientific knowledge has become more complex since George Basalla proposed his model of how science was transmitted from Europe to the rest of the world. Since its publication in 1967, Basalla’s model has been the subject of extensive critique, particularly regarding his assumption of a ‘unique western scientific ideology waiting to be diffused into new scientific territories’ and his neglect of the political, economic and social forces that influenced this process. Instead of this ‘core and periphery’ approach, these processes of scientific development are better characterised as interdependent, reflective of the imperial webs or networks that connected Britain and its colonies. To further examine these technocratic approaches to understanding and managing Australian climates, emerging environmental historians are drawing on the critiques of centralised state


planning and expertise offered by James C. Scott, Timothy Mitchell and Greg Bankoff.\textsuperscript{19}

These recent works of environmental history also illustrate the extent to which environmental change is mediated through existing inequities. They show that the social relations within these societies positioned some people to be more at risk from climate variability than others. Whether faced with drought in southwestern Australia or floods in Queensland, the social dynamics of power over time have rendered some people more vulnerable to environmental hazards than others. This vulnerability, rather than being simply a consequence of misfortune or ill-preparedness, is the product of complex processes that historians can unravel in order to discern the interactions of human activities and the environment over time.\textsuperscript{20} As anthropogenic climate change complicates these interactions further, such environmental histories suggest the importance of considering a society’s exposure to risks in a much broader historical, social and ecological context.

Theorists such as Ulrich Beck and Anthony Giddens have argued that we live in a new age of the ‘risk society’ and yet, as many Australian climate histories show, our associated fears for the future are not without precedent.\textsuperscript{21} The climatic conditions that we will face in the future will be new to us, but change itself is not new and environmental histories can shed light on how humans have responded to and understood environmental change in the past. Perceptions of environmental change and the potential consequences for economic development and human health have long provoked what James Beattie regards as expressions of ‘environmental anxiety’.\textsuperscript{22} Echoing Richard Grove, Beattie argues that such concerns prompted efforts to both conserve and improve colonial environments.\textsuperscript{23} Anxieties about climate change, particularly as a consequence of human activity, figured prominently and prompted attempts to engineer the weather long into the twentieth century.\textsuperscript{24} If such anxieties are expressions of colonists’ perceptions of their vulnerability in new lands, then


studies of the discernible and underlying vulnerabilities of settler societies might go some way to finding ‘anxiety’ in narratives of empire and thus complicate the picture of European expansion in the Antipodes.25 Our anxieties persist in the risk society, where we reap what previous generations have sown.

These legacies of the past also shape the present and the future as a result of path dependence.26 Commonly used in economics, the notion of path dependence not only refers to our physical inheritance from the past, of structures and technologies, but also the cultures and communities which develop around them and similarly constrain our choices.27 Examining the history of these interactions not only contextualises their development, but also reveals the alternative trajectories that might have materialised.28 Furthermore, such research might show that no matter how entrenched these dependencies may seem, some of these relationships have developed only relatively recently. For instance, in his consideration of the uses of history in energy policy, environmental historian Paul Sabin points to the rapid technological changes of the twentieth century that, while seeming inevitable in retrospect and intractable at present, show the potential for similar transformations in the future.29

The significance of understanding our physical and cultural inheritance is laid bare when we consider that they have informed the definition of what some environmental scientists describe as ‘planetary boundaries’, which provide a yardstick for the measure of a ‘desirable planetary state’.30 Within these chemical and biophysical planetary boundaries, humanity can function safely: the patterns of path dependence developed during the relatively stable environment of the Holocene can continue. But the transgression of these boundaries could trigger abrupt and potentially catastrophic environmental change.31 Natural scientists fear we have already trespassed three such planetary boundaries, among them climate change.

Writing at the dawn of the new millennium, environmental historian John R. McNeill observed that the ecological changes humans had wrought over the past century were unprecedented and represented ‘something new under the sun’.32 For Nobel Laureate chemist Paul Crutzen and ecologist Eugene Stoermer, these changes were part of a much longer trend that had emerged in the late

26 Many thanks to Graeme Davison for sharing his thoughts on this topic.
28 Martin V. Melosi, ‘Path Dependence and Urban History: Is a Marriage Possible?’, in Resources of the City: Contributions to an Environmental History of Modern Europe, eds Dieter Schott, Bill Luckin and Genevieve Massard-Guilbaud (Burlington, VT: Ashgate, 2005), 262–75.
31 Ibid.
eighteenth century and accelerated after World War Two. As a consequence of the enormous expansion in the use of fossil fuels during this period, Crutzen and Stoermer argued, the planet’s biophysical systems were no longer independent of humans, who had collectively become a geophysical force causing planetary change. Consequently, the ‘hot breath of civilisation’, to borrow from author Ian McEwan, had given life to a new geological epoch, the Anthropocene.

Here, the maintenance of ‘two cultures’ and its fragmentation of knowledge no longer makes sense. Historians are not the only researchers asking historical questions in the effort to understand the roots of anthropogenic climate change. From geologists to economists, the study of global change requires taking a long look at the past. In a recent collaboration with climatologists, environmental historians contributed their archival research skills to the study of climate variability in eighteenth and nineteenth century southeastern Australia. In the Anthropocene, comprehending the past requires a shared endeavour of interdisciplinarity to cross spatial and temporal scales, and to account for the different physical and social effects of anthropogenic climate change.

The very concept of the Anthropocene has significant implications for the historian’s craft, not least our understandings of humans and human agency. Historian Dipesh Chakrabarty encourages historians to consider the human in terms of different registers or scales, from studies of societies, freedom and equity, to a universalising history of the species that reaches into deep time. Owing to their scales, humans are endowed with ontological agency in the former, while there is no ontological dimension for the latter. The role of the environmental historian is to find the connection between them. As environmental historian Tom Griffiths argues:

Environmental history frequently makes more sense on a regional or global scale than it does on a national one. It uniquely bridges planetary and deeply local perspectives,

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staking a claim for histories that are bound intimately to place and also embrace the
natural world, histories that are deeply attentive to human and biological parochialism.39

Writing histories across these scales might therefore help to illuminate the
conundrum of our environmental crisis: although we are collectively the cause
of anthropogenic climate change, we experience climate change unevenly and
our political agency complicates collective action.40

As Chakrabarty observes, imagining human agency on a geological scale is
no easy task. Historians face the challenge of somehow appealing to human
experience in order to write histories that connect their readers with this vast,
seemingly incomprehensible, scale.41 The approaches that Australian social and
environmental historians Tom Griffiths and Brigid Hains adopted to write
human histories about the driest continent on Earth, Antarctica, for instance,
offer valuable examples of how this task might be undertaken.42 By combining
their reflections on their own journeys to the South Pole with research on earlier
expeditions by the likes of Scott and Mawson and the others who followed, they
were able to humanise the place and find life in the ice.

Such histories reflect the trend among environmental historians since the
1990s of charting the ever-shifting relationships between human and non-
human elements that complicate the notion of a human ‘agent’ that is somehow
divorced from the wider world.43 Acknowledging such interdependence is not to
advocate environmental determinism. Rather, these relationships form the
tangled histories of what environmental historian Richard White calls ‘hybrid
landscapes’, which emphasise connections, conflicts and complexities, instead of
the Enlightenment binary of nature and culture.44 These are the places, White
argues, ‘where we spend our lives’. Consequently, histories of such hybrid
landscapes might present more familiar and recognisable narratives that step
beyond morality tales of progress or decline.45

Whether this direction can achieve the goals of environmental history
remains open to debate, as an exchange between environmental historians in the
World Without Us: The State of American Environmental History’, Paul Sutter
wondered if the ‘hybrid’ turn, by favouring complexity over declension, had
taken the sting out of the field’s potential for environmental advocacy.46 For

42 Tom Griffiths, Slicing the Silence: Voyaging to Antarctica (Sydney: UNSW Press, 2007); and Brigid
Hains, The Ice and the Inland: Mawson, Flynn and the Frontier (Melbourne: Melbourne University
Press, 2002).
43 Linda Nash, ‘The Agency of Nature or the Nature of Agency?’, Environmental History 10 (2005),
67–9.
44 Richard White, ‘From Wilderness to Hybrid Landscapes: The Cultural Turn in Environmental
45 Ibid., 564.
Linda Nash, however, environmental historians had not gone far enough, for ‘the future of environmental history lies in showing that all history is environmental’.47 Yet these positions are not irreconcilable. The urgency of environmental crisis motivates both perspectives and neither position seeks to reproduce the nature–culture division that environmental historians have long sought to overcome. Rather, the role for environmental historians may lie in their capacity to underline the historical significance and the immensity of what it means for humans to have produced the Anthropocene, perhaps the ultimate hybridity.

Returning people to public debate and policy discussions about anthropogenic climate change may seem tautological. Nevertheless, despite the role of humans in creating and experiencing this predicament, people are being written out by what climatologist Mike Hulme describes as a new form of climate determinism, what he calls ‘climate reductionism’.48 Hulme locates such reductionism in the claims of scientists, analysts and commentators who, in their predictions for the future, have elevated and isolated climate as the primary determinant of the past, present and future. In these narratives of a ‘climate-shaped destiny’ that derive from the hegemony of the natural sciences, he argues, the complexities of human and non-human interactions are lost, contingency overlooked, and human agency ignored.49 As historians know, however, neither the past nor the future have been historically determined, and through their craft, they can offer helpful antidotes to the ‘fatalism and resignation’ that appears to have descended on the issue of anthropogenic climate change.50

At the 2008 conference of the Australian Historical Association, a roundtable of historians asked, ‘Can environmental history save the world?’51 These caped crusaders called for more interdisciplinary and socially and culturally inclusive approaches that could engage with policy, connect people to place, and understand the complex processes that have led to the present. In terms of subject matter, environmental historians might also consider the commodity flows of Australia’s mineral resources; resource use and the associated heat islanding or warming of our cities and suburbs; and the use and misuse of the nation’s estuaries, coastline and vast marine territories, in light of the causes and consequences of anthropogenic climate change.

49 See also Mark Carey, ‘Climate and History: A Critical Review of Historical Climatology and Climate Change Historiography’, WIREs Climate Change 3 (2012): 233–49.
Australia is one of the world’s largest exporters of iron ore and coal, and earns handsome dividends as a result. Despite the potential for transnational inquiries and the socioeconomic, political, cultural, ecological and scientific significance of extracting the nation’s mineral resources, Quarry Australia remains underexplored in the historical literature.\(^{52}\) Although environmental historians of the ‘first suburban nation’ have gone some way to consider the land and water use of Australia’s cities and suburbs, further research might examine energy consumption, pollution and climate variability in these places.\(^{53}\) If Australia’s suburbs offer opportunities for the decentralisation of water and energy infrastructure, as some scholars suggest, these areas may well prove to be important sites for self-sufficiency and a reduced footprint on the continent.\(^{54}\) Meanwhile, for a land ‘girt by sea’, coastal, estuarine, wetland and marine environmental history remains remarkably undeveloped in Australia.\(^{55}\) The historical examination of the changing relationships between human communities and the aquatic realm could contextualise and contribute to current debates about anthropogenic climate change, fisheries, offshore mining, and coastal development. In addition to embracing the vertical, these emerging areas of research promise to transcend disciplinary, geographical and political


boundaries, and offer historians significant opportunities for interdisciplinary collaboration.\textsuperscript{56}

In his presidential address at the 2013 conference of the American Historical Association, environmental historian William Cronon focused on the importance of storytelling for the future of the historical profession.\textsuperscript{57} To outlast the competition of other media, Cronon urged his colleagues to disregard their concerns of presentism in order to tell stories that reconnect the past to the present, and morally engage their readers with the world. This message echoed the one he delivered to environmental historians over a decade ago: ‘we cannot help but embrace storytelling if we hope to persuade readers of the importance of our subject’.\textsuperscript{58} As Tom Griffiths puts it, the story is ‘the most powerful educational tool we possess; it is learning distilled in common language. It is also a privileged carrier of truth, a way of allowing for multiplicity and complexity at the same time as guaranteeing memorability.’\textsuperscript{59} Environmental histories can offer tangible connections to the past, to distant places, and to the complex atmospheric and oceanic mechanisms that control the Earth’s climate that might otherwise remain beyond our comprehension. By telling stories that reflect careful analysis and rigorous scholarship, historians can help make sense of climate change and inform the ways we approach an uncertain future.

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\textsuperscript{56} The CRC for Water Sensitive Cities is one such interdisciplinary project involving researchers across Australia, including historians, which seeks to inform water management practices around the world. See http://watersensitivecities.org.au/.

